

TABLE OF CONTENTS

LIST OF TABLES	xiii
LIST OF FIGURES	xiv
EXECUTIVE SUMMARY	ES-1
 CHAPTER 1 INTRODUCTION	
 1.1 PURPOSE AND REQUIREMENT FOR THE INRMP	1-1
1.1.1 Regulatory Requirements and Legal Authority	1-2
1.1.2 Guidance and Required Elements	1-2
1.1.3 Natural Resource Management Drivers	1-3
1.1.4 INRMP Development and Coordination	1-4
1.1.4.1 PUBLIC COMMENT	1-5
1.1.4.2 RESOURCE AGENCY COORDINATION	1-5
1.1.5 Evaluation and Updates of the INRMP	1-6
 1.2 ECOSYSTEM MANAGEMENT POLICY	1-6
1.2.1 DoD Policy and Programs	1-7
1.2.2 Camp Pendleton's Ecosystem Management Philosophy	1-8
1.2.3 Regional Contribution and Environmental Stewardship	1-9
1.2.4 Regional Conservation Planning	1-10
 1.3 CAMP PENDLETON REGIONAL SETTING, LOCATION, AND MISSION	1-13
1.3.1 Regional Setting and Location	1-13
1.3.2 Military Mission	1-13
 1.4 NATURAL RESOURCE MANAGEMENT STRUCTURE	1-14
1.4.1 AC/S Environmental Security	1-14
1.4.1.1 NATURAL RESOURCES DEPARTMENT	1-17
1.4.1.2 ENVIRONMENTAL COMPLIANCE DEPARTMENT	1-20
1.4.1.3 INFORMATION SYSTEMS (IS) BRANCH	1-22
1.4.2 Marine Corps Community Services	1-23
1.4.3 AC/S Facilities	1-23
1.4.3.1 OFFICE OF WATER RESOURCES	1-24
1.4.3.2 PUBLIC WORKS DEPARTMENT	1-24
1.4.3.3 FACILITIES MAINTENANCE DEPARTMENT	1-24
1.4.3.4 REAL ESTATE OFFICE	1-25
1.4.4 AC/S Operations and Training	1-25
1.4.4.1 RANGE OPERATIONS DIVISION	1-25
1.4.4.2 OPERATIONS DIVISION	1-25
1.4.4.3 TRAINING RESOURCES MANAGEMENT DIVISION	1-25
1.4.5 Community Plans and Liaison Office	1-26
1.4.6 AC/S Installation Security and Safety	1-26
1.4.6.1 PROVOST MARSHAL'S OFFICE	1-26
1.4.6.2 FIRE DEPARTMENT	1-27

1.4.7	Western Regional Environmental Coordinator	1-27
1.4.8	Marine Corps Air Station, Camp Pendleton	1-27
1.5	NATURAL RESOURCE MANAGEMENT AND INRMP GOALS	1-28
1.5.1	Marine Corps Natural Resource Goals	1-28
1.5.2	Camp Pendleton Natural Resource Management Goals	1-31
1.5.3	INRMP Goals	1-31
1.6	RELATIONSHIP OF THE INRMP TO EXISTING PLANS	1-32
1.7	ORGANIZATION OF THE INRMP	1-32

CHAPTER 2 SETTING: NATURAL RESOURCES

2.1	PHYSICAL ENVIRONMENT	2-1
2.1.1	Installation Location	2-1
2.1.2	Climate	2-1
2.1.3	Topography	2-2
2.1.4	Geology and Soils	2-5
2.1.5	Hydrology	2-5
2.1.5.1	WATERSHEDS	2-5
2.1.5.2	PRECIPITATION AND RUNOFF	2-11
2.1.5.3	FLOODPLAINS AND SURFACE WATERS	2-12
2.1.5.4	WATER QUALITY, SUPPLY, AND USE	2-13
2.1.6	Fire	2-15
2.2	BIOLOGICAL ENVIRONMENT	2-16
2.2.1	Plant Species and Communities	2-16
2.2.1.1	VALUE OF VEGETATION TO MILITARY TRAINING	2-18
2.2.2	WildLife Species	2-21
2.2.3	Landscape Linkages and Wildlife Corridors	2-22
2.2.3.1	WILDLIFE CORRIDOR DEFINITIONS	2-22
2.2.3.2	CAMP PENDLETON WILDLIFE CORRIDORS	2-24
2.2.4	Federally Listed Threatened and Endangered Species at Camp Pendleton	2-26
2.2.4.1	BALD EAGLE	2-29
2.2.4.2	BROWN PELICAN	2-30
2.2.4.3	CALIFORNIA LEAST TERN	2-31
2.2.4.4	COASTAL CALIFORNIA GNATCATCHER	2-32
2.2.4.5	LEAST BELL'S VIREO	2-33
2.2.4.6	LIGHT-FOOTED CLAPPER RAIL	2-35
2.2.4.7	PEREGRINE FALCON	2-36
2.2.4.8	SOUTHWESTERN WILLOW FLYCATCHER	2-37
2.2.4.9	WESTERN SNOWY PLOVER	2-39
2.2.4.10	PACIFIC POCKET MOUSE	2-40
2.2.4.11	STEPHENS' KANGAROO RAT	2-41
2.2.4.12	SOUTHERN STEELHEAD TROUT	2-42
2.2.4.13	TIDEWATER GOBY	2-42
2.2.4.14	ARROYO TOAD	2-44

2.2.4.15	RIVERSIDE FAIRY SHRIMP	2-45
2.2.4.16	SAN DIEGO FAIRY SHRIMP	2-46
2.2.4.17	SAN DIEGO BUTTON-CELERY	2-47
2.2.4.18	SPREADING NAVARRETIA	2-47
2.2.4.19	THREAD-LEAF BRODIAEA	2-48

CHAPTER 3 SETTING: LAND USE

3.1	REGIONAL AND HISTORIC LAND USE	3-1
3.1.1	Regional Environment: Adjacent Land Use and Trends	3-2
3.1.1.1	COMMUNITIES OF DELUZ AND FALLBROOK	3-3
3.1.1.2	CITY OF OCEANSIDE	3-3
3.1.1.3	CITY OF SAN CLEMENTE	3-4
3.1.1.4	CLEVELAND NATIONAL FOREST	3-4
3.1.1.5	PACIFIC OCEAN	3-5
3.1.2	Historic Land Use	3-5
3.2	CURRENT LAND USE	3-7
3.2.1	Military Training and Support Facilities	3-7
3.2.1.1	MANEUVER TRAINING	3-8
3.2.1.2	IMPACT AREAS	3-10
3.2.1.3	TRAINING SUPPORT FACILITIES	3-15
3.2.1.4	AVIATION OPERATIONS	3-19
3.2.2	Base Infrastructure and Mission Support	3-20
3.2.2.1	CANTONMENT AREAS	3-25
3.2.2.2	RECREATION AREAS	3-26
3.2.2.3	ROADS, TRAILS, FIREBREAKS, ETC.	3-26
3.2.2.4	BORROW SITES, LANDFILLS, AND WOOD YARD	3-26
3.2.2.5	UTILITY LINES AND FENCING	3-29
3.2.3	Real Estate Agreements and Leaseholders	3-29
3.2.3.1	AGRICULTURE	3-30
3.2.3.2	PUBLIC RECREATION - SAN ONOFRE STATE PARK	3-33
3.2.3.3	SAN ONOFRE NUCLEAR GENERATING STATION (SONGS)	3-34
3.2.3.4	SAN DIEGO GAS AND ELECTRIC COMPANY (SEMPRA ENERGY)	3-34
3.2.3.5	INTERSTATE HIGHWAY 5 (I-5 FREEWAY)	3-34
3.2.3.6	NORTH COUNTY TRANSIT DISTRICT RAIL LINE AND MAINTENANCE YARD	3-35

CHAPTER 4 NATURAL RESOURCES MANAGEMENT

4.1	ECOSYSTEM MANAGEMENT	4-2
4.2	NATURAL RESOURCES INVENTORY	4-5
4.2.1	Vegetation and Habitat Mapping	4-6
4.2.2	Species Specific Surveys/Monitoring	4-7

4.2.3	Long Term Trend Monitoring and Analysis	4-11
4.3	WETLANDS, ESTUARY/COASTAL, AND RIPARIAN MANAGEMENT	4-13
4.3.1	General Wetlands, Estuary/Coastal, and Riparian Management	4-14
4.3.2	Isolated Ephemeral Wetlands/Vernal Pool Management	4-16
4.3.3	Estuary/Coastal Zone Management	4-18
4.3.4	Riparian Habitat Management	4-20
4.4	WILDLIFE MANAGEMENT	4-22
4.4.1	General Wildlife Management	4-22
4.4.2	Migratory Bird Management	4-23
4.4.3	Wildlife Damage Management (Including Bird Aircraft Strike Hazard)	4-27
4.4.4	Integrated Pest Management	4-30
4.4.5	Game and Sport Fisheries Management	4-31
4.5	THREATENED AND ENDANGERED SPECIES MANAGEMENT	4-33
4.5.1	Avoidance/Minimization and Awareness	4-36
4.5.2	Surveys and Monitoring	4-38
4.5.3	Research	4-41
4.5.4	General Management (Including Compensation and Mitigation)	4-42
4.6	EXOTIC INVASIVE SPECIES CONTROL	4-45
4.6.1	Exotic Invasive Plants	4-46
4.6.2	Exotic Animals	4-48
4.7	WATERSHED MANAGEMENT	4-49
4.7.1	Water Resources Management	4-51
4.7.2	General Vegetation Management and Soil Conservation	4-54
4.8	GROUND MAINTENANCE AND LANDSCAPPING	4-57
4.9	COMMERCIAL FORESTRY – N/A at Camp Pendleton	4-58
4.10	GRAZING AND AGRICULTURAL OUTLEASES	4-59
4.10.1	Livestock Grazing	4-59
4.10.2	Row Crop Production	4-60
4.10.3	Native Seed Collection	4-61
4.11	FIRE MANAGEMENT	4-62
4.11.1	Pre-Suppression	4-62
4.11.2	Suppression	4-65
4.11.3	Post-Suppression	4-66
4.12	ENVIRONMENTAL PLANNING	4-69
4.12.1	NEPA Review	4-70
4.12.2	Consultations	4-73
4.12.3	Mitigation and Compensation	4-74
4.12.4	Post NEPA Follow up	4-76
4.12.5	Long Range Planning	4-76
4.13	EMERGENCY RESPONSE	4-78
4.14	INFORMATION MANAGEMENT	4-79

CHAPTER 5 PUBLIC ACCESS, NATURAL RESOURCE RELATED RECREATION, AND EDUCATION

5.1 PUBLIC ACCESS	5-3
5.1.1 Public Access Policy and Coordination	5-4
5.1.2 Real Estate Agreements: Leases, Easements, etc.	5-5
5.2 HUNTING AND FISHING	5-6
5.2.1 Recreational Hunting	5-7
5.2.2 Recreational Fishing	5-9
5.3 OTHER NATURAL RESOURCE RELATED RECREATION	5-10
5.3.1 Camping and Picnicking	5-13
5.3.2 Beach and Ocean Use	5-14
5.3.3 Equestrian Program	5-15
5.3.4 Hiking, Jogging, and Bicycling	5-16
5.4 NONMILITARY OFF ROAD VEHICLES	5-17
5.5 ENVIRONMENTAL EDUCATION	5-17

CHAPTER 6 REGIONAL ISSUES, CONTRIBUTIONS, AND INVOLVEMENT

6.1 REGIONAL ISSUES AFFECTING CAMP PENDLETON'S MILITARY MISSION	6-1
6.1.1 Public Interstate Freeways, Railroad Right-of-Ways, and Future Transportation Corridors	6-8
6.1.2 Public Utilities	6-9
6.1.3 Commercial Airport Facilities	6-9
6.1.4 Recreational Use and Access	6-10
6.1.5 Environmental Encroachment Issues	6-11
6.2 REGIONAL PLANNING, PARTNERING, AND COOPERATIVE AGREEMENTS	6-12
6.2.1 Natural Communities Conservation Planning (NCCP)	6-12
6.2.1.1 CITY OF SAN DIEGO MULTIPLE SPECIES CONSERVATION PROGRAM (MSCP)	6-13
6.2.1.2 MULTIPLE HABITAT CONSERVATION PLANNING (MHCP) AND NORTH COUNTY WILDLIFE FORUM	6-14
6.2.1.3 COUNTY OF SAN DIEGO MULTIPLE HABITAT CONSERVATION AND OPEN SPACE PROGRAM (MHCOSP)	6-14
6.2.1.4 SAN DIEGO GAS & ELECTRIC (SDG&E) COMPANY SUBREGIONAL PLAN	6-14
6.2.1.5 SOUTH ORANGE COUNTY SUBREGIONAL PLAN	6-14
6.2.1.6 CENTRAL COASTAL ORANGE COUNTY SUBREGIONAL PLAN	6-17
6.2.2 Riverside County Integrated Planning Program	6-17

6.2.3	San Diego County Water Authority	6-18
6.2.4	The Nature Conservancy Cooperative Agreement for Exotics Control	6-19
6.2.5	National and Regional Interagency Fire Management Planning, Coordination, and Response	6-19
6.2.6	Fish and Wildlife Inter-Agency Coordination	6-20
6.3	RESEARCH, SURVEYS, AND MONITORING	6-22
6.3.1	The Camp Pendleton Alternative Futures Study	6-22
6.3.2	Effects of Wildfire on Coastal California Gnatcatchers	6-23
6.3.3	Habitat Suitability Evaluation for Endangered Southern Steelhead Trout	6-23
6.3.4	Restoration and Maintenance of Upland Habitat	6-24
6.3.5	Wildland Fire Studies	6-24
6.3.6	Basewide Herpetological (Amphibian and Reptile) Survey	6-25
6.3.7	International Partners in Flight Program: Monitoring Avian Productivity and Survivorship (MAPS)	6-25
6.3.8	Deer Management Study	6-26
6.3.9	California Least Tern Studies	6-26
6.3.10	Other Non-Base Funded Research	6-26
6.3.11	Fire Management Equipment Field Testing and Evaluation	6-27
6.4	ECOSYSTEM MANAGEMENT AND WATERSHED PROTECTION	6-27
6.4.1	Programmatic Ecosystem Management Planning: Riparian and Estuarine/Beach Habitats	6-27
6.4.2	Santa Margarita River Watershed Management Program	6-28
6.4.3	Team Arundo-Watershed Exotics Control	6-29
6.4.4	Santa Margarita and San Luis Rey Weed Management Area Program	6-29
6.4.5	Santa Margarita Ecological Reserve (SMER)	6-30
6.5	EDUCATION, AWARENESS, AND INFORMATION EXCHANGE	6-30
6.5.1	Regional Information Exchange	6-35
6.5.2	Off-Base Environmental Awareness Education	6-35
6.5.3	Arroyo Toad Symposium	6-35
6.5.4	State of California Biodiversity Council (CBC)	6-36

CHAPTER 7 INTEGRATION, IMPLEMENTATION, AND ENFORCEMENT

7.1	PROGRAMMATIC INSTRUCTIONS	7-2
7.1.1	Base Orders	7-2
7.1.2	Environmental Compliance and Protection Standard Operating Procedures (ECPSOP)	7-3
7.1.3	Environmental Guidebook	7-3
7.1.4	Biological Opinion Terms and Conditions	7-3
7.1.5	Categorical Exclusions	7-3
7.1.6	Architectural and Engineering Environmental Guidebook	7-4
7.2	ENVIRONMENTAL TRAINING, EDUCATION, AND AWARENESS	7-4

7.3 ENVIRONMENTAL INSPECTION AND COMPLIANCE	7-5
7.3.1 Marine Corps: Environmental Compliance Evaluation (ECE)	7-5
7.3.2 Annual Environmental Compliance Evaluation (Self-Audit Program)	7-6
7.3.3 Annual Plan of Action and Milestones (POA&M) Process	7-6
7.3.4 Inspection and Compliance Oversight	7-7
7.4 ENFORCEMENT	7-8
7.4.1 Range Operations Division, AC/S Operations and Training	7-9
7.4.2 Resource Enforcement and Compliance Branch, AC/S Environmental Security	7-9
7.4.3 Provost Marshal's Office (PMO)	7-10
7.4.4 Semper Fit Division, AC/S MCCA	7-10
7.4.5 NEPA, Permitting, and Mitigation Follow Up	7-10
7.4.6 Resident Officer in Charge of Construction (ROICC)	7-10
7.5 INFORMATION MANAGEMENT AND GIS	7-11
7.5.1 GIS/Systems Information Organizations on Camp Pendleton	7-11
7.5.2 Information/Data Management, Dissemination, and Integration	7-12
7.5.2.1 PUBLICATION OF NATURAL RESOURCE DATA	7-12
7.5.2.2 TECHNICAL INTEGRATED INFORMATION CENTER (TIIC) "LIBRARY"	7-12
7.5.2.3 GIS/IS USER NEEDS ASSESSMENT	7-12
7.5.2.4 BASEWIDE GIS INTEGRATION	7-13
7.5.2.5 DATA STANDARDIZATION	7-13
7.6 ENVIRONMENTAL PLANNING	7-14
7.6.1 Planning Structure and Process	7-15
7.6.2 Natural Resource Review	7-16
7.6.2.1 ENDANGERED SPECIES ACT (ESA)	7-16
7.6.2.2 CLEAN WATER ACT	7-18
7.6.2.3 EXECUTIVE ORDERS: WETLANDS AND FLOODPLAINS	7-19
7.6.2.4 MIGRATORY BIRD TREATY ACT	7-20
7.6.3 Mitigation	7-20
7.6.3.1 EXISTING MITIGATION ACTIONS	7-21
7.6.3.2 MITIGATION PLANNING	7-21
7.6.3.3 GENERAL MITIGATION REQUIREMENTS	7-23
7.6.3.4 FUTURE MITIGATION ALTERNATIVES: MITIGATION BANKING AND CONSERVATION AGREEMENTS	7-25
7.6.4 Long Range and Master Planning	7-26
7.7 PROGRAM AND PROJECT FUNDING	7-27
7.8 INRMP EVALUATIONS AND UPDATE PROCESS	7-28

REFERENCES

ACRONYMS AND ABBREVIATIONS

GLOSSARY

APPENDIX A	NATURAL RESOURCE MANAGEMENT DRIVERS
APPENDIX B	INTERNAL STAKEHOLDERS AND PERSONS CONTACTED
APPENDIX C	PUBLIC COMMENTS
APPENDIX D	CAMP PENDLETON SOILS: CODES, ACREAGES, AND ERODIBILITY
APPENDIX E	PLANT COMMUNITIES OF CAMP PENDLETON
APPENDIX F	PLANT SPECIES ON CAMP PENDLETON
APPENDIX G	WILDLIFE SPECIES ON CAMP PENDLETON
APPENDIX H	ESTUARINE AND BEACH ECOSYSTEM CONSERVATION PLAN
APPENDIX I	RIPARIAN ECOSYSTEM CONSERVATION PLAN
APPENDIX J	UPLAND ECOSYSTEM CONSERVATION PLAN
APPENDIX K	THREATENED AND ENDANGERED SPECIES AT CAMP PENDLETON: RECOVERY PLAN STATUS
APPENDIX L	MISSION ESSENTIAL TASKS LIST FOR TENANT UNITS LOCATED AT CAMP PENDLETON
APPENDIX M	REAL ESTATE AGREEMENTS
APPENDIX N	GEOGRAPHIC AND SPATIAL DATA REQUIREMENTS
APPENDIX O	RIPARIAN AND ESTUARINE/BEACH BIOLOGICAL OPINION: REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS
APPENDIX P	UPLAND HABITAT BIOLOGICAL OPINION: TERMS AND CONDITIONS, REASONABLE AND PRUDENT MEASURES, AND CONSERVATION RECOMMENDATIONS.

LIST OF TABLES

Table	Title	Page
2-1	Principal watersheds: acreage and percent occupation occurring on Camp Pendleton.	2-6
2-2	Recent hydrologic records for gaging stations on or near Camp Pendleton.	2-12
2-3	Number of native and nonnative plant species at Camp Pendleton, grouped by vegetation type.	2-17
2-4	Federally listed threatened and endangered plant and wildlife species at Camp Pendleton.	2-29
2-5	Number of singing male least Bell's vireos on different drainages at Camp Pendleton, 1978 to 2000 (data sources: Salata 1983; Griffith & Griffith 1992; Pavelka 1994; Kus 1996; Griffith Wildlife Biology 1997, 1998, 1999a, 2000). (Table modified from Griffith Wildlife Biology 1999b.)	2-34
2- 6	The distribution and abundance of singing (territorial) male southwestern willow flycatchers observed on different drainages at Camp Pendleton, 1981 to 1999 (data sources: Griffith & Griffith 1997b, 1998, 1999a, 1999c; Kus 2001).	2-38
2-7	Western snowy plover nest monitoring data from 1994 to 2000. Number of breeding males and females based on actual number of known nests, data provided by USGS/USFWS nest monitors (Collier & Powell 2000).	2-40
2-8	Tidewater goby survey data for different drainages at Camp Pendleton (data sources: Holland et al. 2001; Swift & Holland 1998; Swift et al. 1994; Swift 1999a, 1999b).	2-44
4-1	Federally listed riparian and estuarine/beach species population goals.	4-35
4-2	Consultation class categories and action required.	4-36
4-3	Recent (since 1997) erosion control projects conducted or proposed on Base.	4-55
4-4	Fire Danger Rating System.	4-64
5-1	Camp Pendleton recreational facilities/resources available.	5-2
5-2	Hunting seasons on Camp Pendleton.	5-7

LIST OF FIGURES

Figure	Title	Page
1-1	Camp Pendleton Regional and Vicinity Map	1-15
1-2	Camp Pendleton Land Use	1-29
2-1	Slope/Topography	2-3
2-2	Soil Types	2-7
2-3	Watersheds	2-9
2-4	Major Vegetation Types	2-19
2-5	Threatened and Endangered Species	2-27
3-1	Camp Pendleton Regional Airspace Profile (Special Use/Restricted)	3-11
3-2	Ground Training Operations	3-13
3-3	Aviation Operations (Airspace)	3-21
3-4	Aviation Operations (Facilities)	3-23
3-5	Camp Pendleton Support Facilities	3-27
3-6	Real Estate Agreements and Leases	3-31
4-1	Fire Frequency and Spatial Distribution (1973-1998)	4-67
5-1	Recreation and Public Access	5-11
6-1	Mission Encroachment: Urbanization (Development, Utilities, Public Roads)	6-3
6-2	Mission Encroachment: Lease Agreements (Rail, Highway, Agriculture, SONGS)	6-5
6-3	Southern Coastal Sage Scrub NCCP Region	6-15
6-4	Arundo Control Efforts at Camp Pendleton	6-31
6-5	Santa Margarita River Watershed	6-33